October 21, 2003

To: Paul Dabbs, Kamyar, Jonas Minton, DWR
Re: Bulletin 160 draft
From: Dr. Peter H. Gleick, Pacific Institute

Comments on the "Future Scenarios" Section of the September 30th Draft Report From Peter H. Gleick, Pacific Institute

Below please find several comments on the "Future Scenarios" Section of the September 30th draft report, starting on page 3-31. There are a number of important errors and inconsistencies in this section:

Page 3-32: Overall, I still object to the creation of Scenario 4 – Assure adequate food production. I believe this Scenario was politically motivated and is inappropriate precisely because "adequate food production" can be fit into all of the other three Scenarios – i.e., the state can provide adequate food production as indicated by AB 2587 in each of the other three visions.

Page 3-34: Second to last bullet "Farmers are increasingly using sprinklers…" There must be more distinction between the different scenarios. I recommend adding a couple of qualifiers: specifically rewrite the third sentence in this bullet: "**Improved water management is modestly increasing water efficiency over 2000 levels."**

Page 3-34: Last bullet "Farmers plant more densely. The industry calls it "more crop per drop." NO! This is an error. The term "more crop per drop" means producing more food with the water we have, but it does NOT mean more dense planting. It specifically means more efficient use of irrigation water. I propose the following re-wording:

"**Farmers produce more "crop per drop" through a variety of means, including changes in irrigation methods away from inefficient approaches, though more improvement is possible."** And delete the rest of the bullet. In particular, the sentence on "Deciduous trees is incorrect (yield per acre goes up but yield per tree goes down???) should be deleted.

Page 3-36: second bullet "Efficiency standards have been enacted…" If this is the "Business as usual" scenario, then this list should include only those already enacted – toilets and washing machines. Have spray valves in restaurants been enacted? If so, leave them. But **delete the "etc**."

Page 3-38: The Agriculture section of the efficient scenario (Scenario 2) could be strengthened and clarified. Replace the last bullet "Farmers use sprinklers…" with the following:

"Farmers use sprinklers and drip irrigation on nearly all appropriate crops and lands. Flooding and furrow irrigation are applied only where more efficient methods cannot be used. Farmers turn irrigation on and off at will and decide exactly where to irrigate based on accurate information on soil moisture and climate conditions. Improved water management is increasing water efficiency. Irrigation techniques improve the uniform distribution of water to all plants, which is also contributing to yields. Shifts in crops toward higher-valued, lower-water using crops is producing more revenue for farmers with less water."

Page 3-40: The section "Efficiency" has some misleading and confusing parts. I suggest the following clarifications:

First bullet: "Naturally occurring conservation…" Delete the superfluous "in the." Replace with "Naturally occurring conservation trend is higher in the agricultural and urban sectors than under Scenario 1." Add the word "current" before "best management practices in the second sentence: "…**implemented efficiency measures that go far beyond current best management practices**." (or "**go far beyond the BMPs in place in 2000**").

Second bullet: Add "Many" at the beginning: "Many new houses are dual plumbed…" It can't be all of them and it should note that this might be appropriate for "new" houses.

Third bullet: delete the term "mandatory" and replace with "comprehensive". This sentence could/should read "**Municipal and agricultural best management practices become comprehensive, encouraging more water-use efficiency improvements and practices to be developed**."

Fourth bullet: delete "eliminated" and replace with "greatly reduced." Also add "institutional" to the sentence, as follows: "**Native vegetation and other innovative landscape techniques have greatly reduced residential and institutional demand for landscape irrigation**."

General comment: Scenario 3 is insufficiently different and distinct from Scenarios 1 and 2. There are also some fundamental contradictions: See comments below:

Page 3-42: Agriculture section, second bullet: Add the sentence "Total water demand in the agricultural sector has gone up."

Third bullet: There is a contradiction here: How can the number of irrigated acres go down here? Are you saying that there is a shift to rainfed agriculture? If so, how can ag produce "more food and fiber per acre…" Also, in the first bullet above this one it says total crop acreage is the same at 9.51 million acres… **I recommend deleting the first sentence of this third bullet.**

Add a bullet: **"There are no new transfers of water from the agricultural sector to the cities."**

The Environment section seems to be a contradiction. It should be most similar to Business as Usual scenario, not Scenario 2.

Page 3-43: Quality Section: add ", but not extended." to the first bullet. It should read "**Water quality best management practices have been fully implemented, but not extended**."

Page 3-43: Quality section, second bullet: NO! This should say "**have reached but not exceeded anticipated levels.**"

Page 3-43: Last bullet: No, this conflicts with the next page where it says "water quality has become a major challenge…" Delete this bullet.

Page 3-44. Under Water Demand, add a bullet that says: "**Water use remains inefficient**."

Page 3-44: Under considerations, add two bullets:

- **Urban water availability is constrained by high water use and limited transfers from agriculture.**
- **Water prices are much higher as scarcity increases and expensive supply options, such as desalination, are pursued in coastal cities.**

Page 3-46: I don't understand the sentence: **Yield per acre of land will be boosted by climate change.** (Second bullet from the bottom.) Do you have an estimate for this that is being included in the scenario? I recommend deleting it – it is controversial in the scientific community.